

CLAIMS

What is claimed is:

- 5 1. A method for processing media data, the method comprising:
 receiving first content containing first content portions encoded according
 to a first content format;
 analyzing the first content to detect sets of related first content portions,
 each set defining a presentation group;
10 for a plurality of presentation groups in the first content, generating a
 respective private transport packet that includes metadata derived from at least
 some of the first content portions in the presentation group, the metadata
 containing information allowing modified production of the first content in a
 manner that is different than an first production of the first content defined by the
15 first content format; and
 storing the first content and the metadata together as second content.
2. A method for presenting content to a client device, the method comprising:
 receiving second content containing first content portions arranged as a
20 series of presentation groups, at least some of the presentation groups including a
 respective associated private transport packet containing metadata that allows
 modified production of the first content in a manner that is different than a first
 production of the first content defined by the first content format;
 producing a content stream for presentation to the client device using at
25 least one of the private transport packets associated with at least some of the
 presentations groups of the first content portions in the second content to produce
 a modified production of at least one of the first content portions in a manner that
 is different that the first production of the first content defined by the first content
 format; and
30 presenting the content stream to the client device.

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3. A method for processing information, the method comprising:
analyzing portions of a logical data stream including data content received
from a source; and
5 based on analyzing the data content received from the source, generating
metadata associated with multiple analyzed portions of the logical data stream, the
metadata being used to support manipulation of presenting the logical data stream
when the data content of the logical data stream is later presented to a receiver for
play back.
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4. A method as in claim 3, wherein generating metadata includes:
generating metadata that i.) supports navigation among different portions
of the logical data stream in response to commands received from remote users
each playing back at least a portion of the logical data stream substantially in real-
15 time; and ii.) enables serial streaming of non-contiguous portions of the logical
data stream in response to commands from remote users requesting presentation
of the logical data stream in a different manner than originally supported by a
content format of the logical data stream.
- 20 5. A method as in claim 3 further comprising:
creating at least one retrievable file formatted to include analyzed portions
of the logical data stream and corresponding generated metadata;
for storage in proximity to a first portion of the logical data stream,
generating a pointer identifying a relative location of a second portion of the
25 logical data stream; and
storing the pointer in relation to the first portion of the data stream.
6. A method as in claim 5 further comprising:

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interleaving the pointer between portions of the logical data stream at an access point including a data field in a known position relative to the first portion of the logical data stream.

5 7. A method as in claim 3 further comprising:
 buffering contiguous portions of the logical data stream;
 generating multiple pointers based on the relative positions of each of
 multiple portions of the logical data stream; and
 inserting the pointers at predetermined data fields interleaved among
 10 portions of the logical data stream.

 8. A method as in claim 7 further comprising:
 utilizing the pointers on playback of the logical data stream to determine
 which portion of the logical data stream is streamed to a user in response to
 15 receiving a command from the user to which the logical data stream is
 transmitted.

 9. A method as in claim 3, wherein the data content is formatted according to MPEG
 (Moving Picture Experts Group).
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 10. A method as in claim 5 further comprising:
 storing the file along with similarly formatted files in a semiconductor
 chip-based memory storage system; and
 streaming the files and data content therein to receiver devices that play
 25 corresponding logical data streams in real-time.

 11. A method as in claim 3 further comprising:
 reserving data fields in the file for tracking the metadata.

30 12. A method as in claim 3, wherein generating metadata includes:

generating time stamps for portions of the logical data stream to support replaying the logical data stream later in time.

13. A method as in claim 12 further comprising:

5 inserting the generated time stamps in relation to corresponding portions of the logical data stream.

14. A method as in claim 3 further comprising:

10 interleaving the logical data stream and generated metadata to produce an enhanced logical data stream; and
 storing the enhanced logical data stream in memory for later retrieval and playback to multiple users.

15. A method as in claim 14 further comprising:

15 removing the metadata prior to transmitting the logical data stream to the receiver.

16. A method as in claim 14, wherein generating metadata includes:

20 generating offset information identifying a location of time stamps supporting playback of the enhanced logical data stream.

17. A method as in claim 3 further comprising:

 storing the data content of the logical data stream and generated metadata in a semiconductor chip based memory unit for later retrieval.

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18. A system to process data content in a logical data stream, the system comprising:

 a buffer to at least temporarily store portions of the logical data stream received from a content source; and

 an analyzer to analyze portions of the logical data stream received from the content source, the analyzer generating metadata associated with multiple

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analyzed portions of the logical data stream, the metadata being used at a later time to support manipulation of presenting the logical data stream when the data content of the logical data stream is presented to a receiver.

- 5 19. A system as in claim 18, wherein the metadata: i.) supports navigation among
different portions of the logical data stream in response to commands received
from remote users each playing back at least a portion of the logical data stream
substantially in real-time; and ii.) enables serial streaming of non-contiguous
portions of the logical data stream in response to commands from remote users
10 requesting presentation of the logical data stream in a different manner than
originally supported by a content format of the logical data stream.
20. A system as in claim 18, wherein the analyzer creates a retrievable file formatted
to include analyzed portions of the logical data stream and corresponding
15 generated metadata, the metadata including pointers to different portions of the
logical data stream.
21. A system as in claim 18, wherein the buffer buffers contiguous portions of the
logical data stream; and wherein the analyzer:
20 generates multiple pointers based on the relative positions of each of
multiple portions of the logical data stream; and
 inserts the pointers into the logical data stream.
22. A system as in claim 18, wherein the data content is formatted according to an
25 MPEG (Moving Picture Experts Group) protocol.
23. A system as in claim 18, wherein the analyzer generates metadata including time
stamps for portions of the logical data stream to support replaying the logical data
stream later in time.

24. A system as in claim 18, wherein the analyzer interleaves the logical data stream and generated metadata to produce an enhanced logical data stream for storage in memory.

5 25. A system as in claim 24, wherein the analyzer generates metadata including offset information identifying a location of time stamps supporting playback of the enhanced logical data stream.

10 26. A system as in claim 18, wherein the analyzer generates metadata including content-dependent information to support navigation within the logical data stream.

15 27. A system as in claim 18 further comprising:
a storage device including multiple addressable memory chips to store the logical data stream and generated metadata for later retrieval.

20 28. A method for presenting data content to a client, the method comprising:
retrieving an enhanced logical data stream including data content and associated metadata, the metadata enabling manipulation of how the data content of the enhanced logical data stream is presented to the client device;
generating a content stream including the data content depending on input from the client device indicating how to present the data content; and
presenting the content stream to the client.

25 29. A method as in claim 28, further comprising:
navigating among different portions of the logical data stream in response to commands received from remote users each playing back at least a portion of the logical data stream substantially in real-time, the metadata enabling serial streaming of non-contiguous portions of the logical data stream in response to
30 commands from remote users requesting presentation of the logical data stream in

a different manner than originally supported by a content format of the logical data stream.

30. A method as in claim 28 further comprising:

5 streaming first portions of the enhanced logical data stream for presentation of corresponding data content to the client while simultaneously streaming second, different portions of the logical data stream for presentation of corresponding data content to another client.

10 31. A method as in claim 30 further comprising:

 utilizing time stamp information stored in the metadata to present the content stream to the client with respect to a real-time clock.

32. A method as in claim 28 further comprising:

15 utilizing offset information stored as metadata to locate time stamps in the enhanced logical data stream for presenting the content stream to the client.

33. A method as in claim 28 further comprising:

20 removing the metadata from the enhanced logical data stream to produce the content stream including data content presented to the client.

34. A method as in claim 28, wherein pointers are interleaved with the data content of the enhanced logical data stream, the pointers identifying portions of the enhanced logical data stream including other metadata.

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35. A method as in claim 34, wherein the pointers support navigation of the enhanced logical data stream and manipulation of how the data content of the enhanced logical data stream is presented to the client.

36. A method as in claim 28, wherein the metadata includes content dependent information to support different types of presentation modes.

37. A method as in claim 28 further comprising:

5 receiving an input command from the client identifying a presentation mode for receiving the data content at the client; and

utilizing pointers stored in specified data fields of the enhanced logical data stream to present the content stream to the client according to the input command.

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38. A method as in claim 37, wherein the input from the client indicates to fast forward presentation of data content in the enhanced logical data stream to the client.

15 39. A method as in claim 37, wherein the input from the client indicates to rewind presentation of data content in the enhanced logical data stream to the client.

40. A method as in claim 28 further comprising:

20 utilizing the metadata stored in the enhanced logical data stream to determine whether to suppress playing back an audio signal of the content stream.

41. A method as in claim 28, wherein the content stream includes commercials that are substantially presented in real time to the client regardless of input from the client.

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42. A system for presenting data content to a client, the system comprising:

30 a stream processor to retrieve an enhanced logical data stream including data content and associated metadata from storage, the metadata of the enhanced logical data stream enabling manipulation of how the data content of the enhanced logical data stream is presented to the client, the stream processor generating a

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content stream including the data content depending on input from the client device indicating how to present the data content to the client; and

a memory device to at least temporarily store an enhanced logical data stream for processing.

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43. A system as in claim 42, wherein the metadata: i.) supports navigation among different portions of the logical data stream in response to commands received from remote users each playing back at least a portion of the logical data stream substantially in real-time; and ii.) enables serial streaming of non-contiguous portions of the logical data stream in response to commands from remote users requesting presentation of the logical data stream in a different manner than originally supported by a content format of the logical data stream.

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44. A system as in claim 42, wherein the stream processor streams first portions of the enhanced logical data stream for presentation of corresponding data content to the client while simultaneously streaming a second, different portions of the logical data stream for presentation of corresponding data content to another client.

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45. A system as in claim 42, wherein the stream processor utilizes time stamp information stored in the metadata to present the content stream to the client with respect to a real-time clock.

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46. A system as in claim 42, wherein the stream processor utilizes offset information stored as metadata to locate time stamps in the enhanced logical data stream for presenting the content stream to the client.

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47. A method as in claim 42, wherein the stream processor removes a substantial portion of the metadata from the enhanced logical data stream to produce the content stream including data content presented to the client.

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48. A system as in claim 42, wherein the metadata includes pointers interleaved with the data content of the enhanced logical data stream, the pointers identifying portions of the enhanced logical data stream including other metadata.

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49. A system as in claim 48, wherein the pointers support navigation of the enhanced logical data stream and manipulation of how the data content of the enhanced logical data stream is presented to the client.

10 50. A system as in claim 42, wherein the stream processor retrieves one of multiple enhanced logical data streams from storage for a substantially real-time presentation of the content stream to the client.

15 51. A system as in claim 42, wherein the stream processor receives an input command from the client identifying a presentation mode for receiving the data content at the client and utilizes pointers stored in specified data fields of the enhanced logical data stream to present the content stream to the client according to the input command.

20 52. A system as in claim 51, wherein the input from the client indicates to fast forward presentation of data content in the enhanced logical data stream to the client.

25 53. A system as in claim 51, wherein the input from the client indicates to rewind presentation of data content in the enhanced logical data stream to the client.

54. A system as in claim 42, wherein the stream processor utilizes the metadata stored in the enhanced logical data stream to determine whether to suppress playing back an audio signal of the content stream.

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55. A system as in claim 42, wherein the content stream includes commercials that are substantially presented in real time to the client regardless of input from the client.

5 56. A computer program product including a computer-readable medium having instructions stored thereon for processing data information, such that the instructions, when carried out by a processing device, enable the processing device to perform the steps of:

10 analyzing portions of a logical data stream including data content received from a source; and

based on analyzing the data content received from the source, generating metadata associated with multiple analyzed portions of the logical data stream, the metadata being used to support manipulation of presenting the logical data stream when the data content of the logical data stream is later presented to a receiver for play back.

57. A system to process data content in a logical data stream, the system comprising:
a buffer to at least temporarily store portions of the logical data stream received from a content source; and

20 means for analyzing portions of the logical data stream received from the content source, the analyzing means generating metadata associated with multiple analyzed portions of the logical data stream, the metadata being used at a later time to support manipulation of presenting the logical data stream when the data content of the logical data stream is presented to a receiver.

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58. A computer program product including a computer-readable medium having instructions stored thereon for processing data information, such that the instructions, when carried out by a processing device, enable the processing device to perform the steps of:

retrieving an enhanced logical data stream including data content and associated metadata, the metadata enabling manipulation of how the data content of the enhanced logical data stream is presented to the client device;

5 generating a content stream including the data content depending on input from the client device indicating how to present the data content; and
 presenting the content stream to the client.

59. A system for presenting data content to a client, the system comprising:

10 means for retrieving an enhanced logical data stream including data content and associated metadata from storage, the metadata of the enhanced logical data stream enabling manipulation of how the data content of the enhanced logical data stream is presented to the client, the retrieving means generating a content stream including the data content depending on input from the client device indicating how to present the data content to the client; and
15 a memory device to at least temporarily store the enhanced logical data stream for processing.

60. A method for processing a digital data stream for seamless playback, the method comprising:

20 a) receiving a packetized digital data stream supporting playback in a first manner, said data stream including a plurality of presentation groups;
 b) analyzing said packetized digital data stream to obtain information on said packetized digital data stream;
 c) generating Private Transport Packets (PTPs) for said presentation
25 groups, respectively, based on said information;
 d) storing said packetized digital stream and said PTPs; and
 e) upon receipt of a request from a client, transmitting the packetized digital data stream to the client, enabling the client to play back the packetized

digital data stream in a second manner, utilizing said PTPs, said second manner being different from said first manner.

5 61. A method for processing a digital data stream as in claim 60, wherein each of said private transport packets includes metadata, said metadata being associated with multiple analyzed portions of the data stream, said metadata being used to support manipulation of presenting the data stream.

10 62. A method for processing a digital data stream as in claim 61, wherein said metadata: i) supports navigation among different portions of the data stream in response to commands received from a client each playing back at least a portion of the data stream substantially in real-time; and ii) enables serial streaming of non-contiguous portions of the data stream in response to commands from a client requesting presentation of the data stream in a manner different than originally
15 supported by a content format of the data stream.

20 63. A method for processing a digital data stream as in claim 60, wherein the step of d) storing said packetized digital stream and said PTPs further comprises:
 storing PTPs to precede the corresponding presentation groups in said data stream.

25 64. A method for processing a digital data stream as in claim 60, wherein said PTP includes navigation data, said navigation data including pointers to other PTPs.